ABSTRACT

A method of establishing a multicast transfer route is disclosed that can reduce the cost of entire route under a constraint on delay incurred between starting point and ending points. The method includes the steps of: computing the shortest route with respect to delay connecting the starting point and the plural ending points based on measurement result; computing delay from a node on the shortest route to each ending point and the greatest delay; removing, if the greatest delay satisfies a delay condition, the greatest-cost route from the shortest route in accordance with selection criteria effective for cost reduction; dividing the multicast transfer route into two route trees; and establishing separately computed route as a complementary route that complement the removed route for connecting the two route trees. A method of multicast label switching for realizing the above method is also disclosed. A multicast label switching route is established using hierarchical labels by establishing a common multicast label switching route using a first layer label and establishing plural partial multicast label switching routes for subgroup destinations using lower layer labels. A relay node recognizes the hierarchical labels thereby to label-switch using all hierarchical labels.

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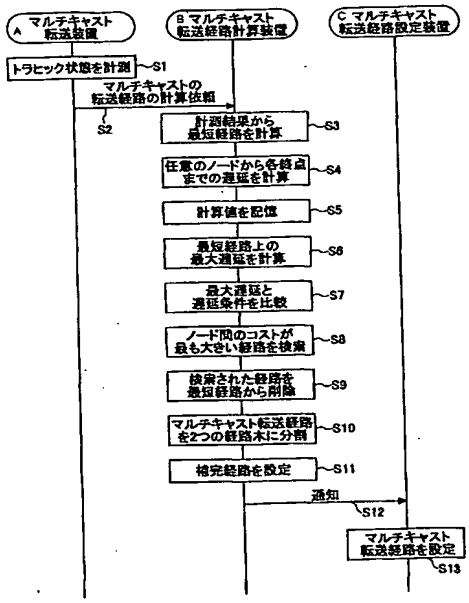
(54) Title: MULTICAST TRANSFER ROUTE SETTING METHOD, AND MULTICAST LABEL SWITCHING METHOD FOR IMPLEMENTING FORMER METHOD

(54) 発明の名称: マルチキャスト転送経路設定方法、及びそれを実現するためのマルチキャストラベルスイッチング方法



A...MULTICAST TRANSFER DEVICE
B...MULTICAST TRANSFER ROUTE CALCULATION DEVICE
C...MULTICAST TRANSFER ROUTE SETTING DEVICE
S1...MEASURE TRAFFIC STATE
S2...ASK FOR CALCULATION OF MULTICAST TRANSFER ROUTE
S3...CALCULATE SHORTEST ROUTE ON THE BASIS OF MEASUREMENT RESULT
S4...CALCULATE DELAYS FROM GIVEN NODE TO END POINTS
S5...STORE CALCULATED VALUES
S6...CALCULATE MAXIMUM DELAY ON SHORTEST ROUTE
S7...COMPARE MAXIMUM DELAY WITH DELAY CONDITION
S8...SEARCH FOR ROUTE WITH HEAVIEST COST BETWEEN NODES
S9...EXCLUDE SOUGHT ROUTE FROM SHORTEST ROUTES
S10...DIVIDE MULTICAST TRANSFER ROUTE INTO TOW ROUTE TREES
S11...SET SUPPLEMENT ROUTE
S12...NOTIFICATION
S13...SET MULTICAST TRANSFER ROUTE

(57) Abstract: A multicast transfer route setting method wherein the shortest route in terms of delay time out of the routes from a starting point to end points is determined by calculation, the delays from a give node on the shortest route to the end points and the maximum delay are calculated, the maximum cost route is excluded from the shortest route according to a selection criterion effective in reducing the cost of the overall tree if the maximum delay meets the delay condition, the multicast transfer route is divided into two route trees, another route determined by calculation is set as a supplement route for the excluded route to interconnect the tow route trees. When a multicast label switching route is set, a shared multicast label switching route is set through a first layer label of the hierarchical labels and partial multicast label switching routes addressed to a sub-group in a lower layer. A relay node judges hierarchical labels to carry out label switching of all the hierarchical labels.

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